

Appendix A

Pending Claims

18. (Twice Amended) A method of determining the presence of one or more target analytes in one or more samples comprising:

- a) contacting said one or more samples with a composition comprising:
 - i) a substrate with a surface comprising a plurality of assay locations, each assay location comprising an array location comprising a plurality of discrete sites; and
 - ii) a population of microspheres comprising at least a first and a second subpopulation each comprising a bioactive agent, wherein said microspheres are distributed on said surface such that said discrete sites each contain no more than one microsphere; and
- b) determining the presence or absence of said target analyte.

19. (Three times Amended) A method of determining the presence of one or more target analytes in one or more samples comprising:

- a) adding said one or more samples to a first substrate comprising a plurality of assay locations, such that said one or more samples is contained at a plurality of said assay locations;
- b) contacting said one or more samples with a second substrate comprising:
 - i) a plurality of array locations, each array location comprising a plurality of discrete sites, wherein at least one assay location is in fluid contact with at least one array location; and
 - ii) a population of microspheres comprising at least a first and a second subpopulation each comprising a bioactive agent, wherein said microspheres are distributed on at least one of said array locations such that said discrete sites each contain no more than one microsphere; and
- c) determining the presence or absence of said target analyte.

- 3 ~~20~~. (Twice Amended) A method according to claim ~~18~~¹, wherein each of said assay locations comprises a library of bioactive agents.
- 4 ~~21~~. (Amended) A method according to claim ~~18~~¹, wherein said substrate is a microtiter plate and each assay location is a microtiter well.
- 5 ~~22~~. (Amended) A method according to claim ~~18~~¹, wherein each discrete site is a bead well.
- 6 ~~23~~. (Amended) A method according to claim ~~18~~¹, wherein each of said subpopulations further comprise an optical signature capable of identifying said bioactive agent.
- 7 ~~24~~. (Twice Amended) A method according to claim ~~18~~¹, wherein at least a first and second microsphere in said subpopulations further comprise an identifier binding ligand that will bind a decoder binding ligand, whereby said bioactive agent is identified by said identifier binding ligand binding to said decoder binding ligand.
- 8 ~~25~~. (Amended) A method according to claim ~~19~~², wherein said first substrate is a microtiter plate.
- 9 ~~26~~. (Amended) A method according to claim ~~19~~² or ~~25~~⁸, wherein said second substrate comprises a plurality of fiber optic bundles comprising a plurality of individual fibers, each bundle comprising an array location, and each individual fiber comprising a bead well.
- 10 ~~27~~. (Amended) A method according to claim ~~19~~², wherein each of said subpopulations further comprise an optical signature capable of identifying said bioactive agent.

- 11 ~~28~~². (Amended) A method according to claim ~~19~~², wherein each of said subpopulations further comprise an identifier binding ligand that will bind a decoder binding ligand such that the identification of the bioactive agent can be elucidated.
- 12 ~~29~~^{1 2}. (Amended) A method according to claim ~~18~~¹ or ~~19~~², wherein at least one of said target analytes is a nucleic acid.
- 13 ~~30~~^{1 2}. A method according to claim ~~18~~¹ or ~~19~~², wherein said microspheres are randomly distributed on said surface.
- 14 ~~31~~^{1 2}. A method according to claim ~~18~~¹ or ~~19~~², wherein at least a first subpopulation of microspheres comprises a bioactive agent comprising nucleic acids.
- 15 ~~32~~^{1 2}. A method according to claim ~~18~~¹ or ~~19~~², wherein at least a first subpopulation of microspheres comprises a bioactive agent comprising a protein.
- 16 ~~33~~³. A method according to claim ~~20~~³, wherein at least a first and second of said assay locations comprise the same library of bioactive agents.
- 17 ~~34~~³. A method according to claim ~~20~~³, wherein at least a first and second of said assay locations comprise different libraries of bioactive agents.
- 18 ~~35~~. (New) A method of determining the presence of one or more target analytes in one or more samples comprising:
- a) contacting said one or more samples with a composition comprising:

i) a composite array comprising a plurality of assay locations, each assay location comprising an array location comprising a plurality of discrete sites; and

ii) a population of microspheres comprising at least a first and a second subpopulation each comprising a bioactive agent, wherein said microspheres are distributed on said surface such that said discrete sites each contain no more than one microsphere; and

b) determining the presence or absence of said target analyte.

19.26. (Amended) A method of determining the presence of one or more target analytes in one or more samples comprising:

a) adding said one or more samples to a first substrate comprising a plurality of assay locations, such that said one or more samples is contained at a plurality of said assay locations;

b) contacting said one or more samples with a second substrate comprising:

i) a composite array comprising a plurality of array locations, each array location comprising a plurality of discrete sites, wherein at least one assay location is in fluid contact with at least one array location; and

ii) a population of microspheres comprising at least a first and a second subpopulation each comprising a bioactive agent, wherein said microspheres are distributed on said surface such that said discrete sites each contain no more than one microsphere; and

c) determining the presence or absence of said target analyte.